

timer

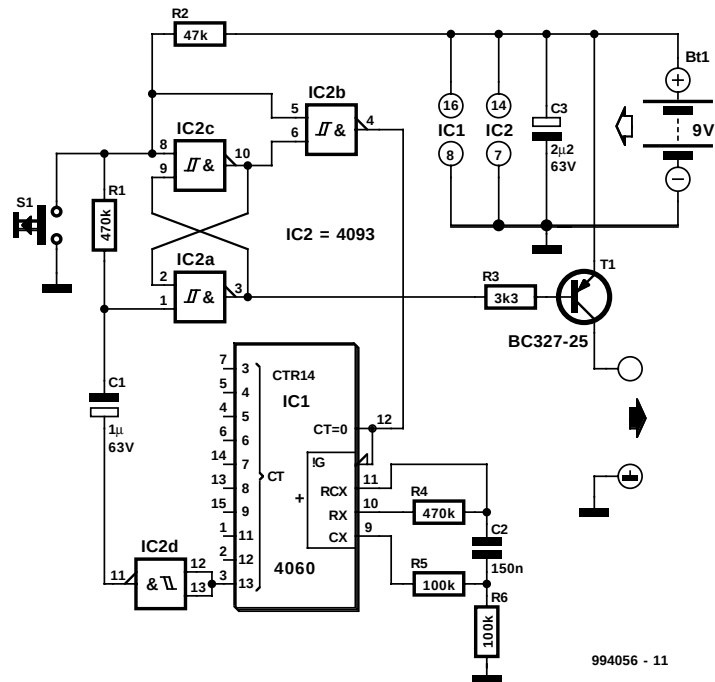
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The timer was designed for switching off a battery charger after a predetermined time to avoid overcharging. It may, however, be used for a number of other applications. It may be switched off before the predetermined time has elapsed and may later be retriggered by a simple push-button switch, S_1 . The circuit does not need any special components or parts. In the quiescent state, current drain is negligible.

The timer is switched on by briefly pressing switch S_1 . If the switch is then not touched again, the timer remains on for a period determined by time constant $R_4 \cdot C_2$. If during this period the switch is pressed again briefly, the period is started anew. If, however, the switch is pressed for a time exceeding time constant $R_1 \cdot C_1$ during the predetermined period, the equipment being controlled is switched off. This time constant may be adapted to individual requirements by altering the value of R_1 or C_1 .

The timing period ($R_4 \cdot C_2$) may be changed by altering the value of R_4 and/or C_2 . It must be borne in mind, however, that the value of R_4 must remain greater than that of R_5 and R_6 .

The slightly unorthodox configuration of the oscillator in IC_1 ensures that the polarity of capacitor C_2 does not change, so that an electrolytic type may be used here. With component values as specified, the 'on' time is six seconds per nanofarad of the value of C_2 . This means that when, for example, the value of this capacitor is $10 \mu\text{F}$, the 'on'



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time is more than 16 hours.

When the supply voltage is 9 V, the base current of output transistor T_1 is around 2.5 mA, which, for a voltage drop of only 0.1 V, results in an output current of up to 100 mA. If this is insufficient for a particular application, a different type of transistor may be used, or the BC327-25 followed by a relay or a MOSFET stage. If the output current is not required to be as large as stated, the value

of base resistor R_3 may be increased.

The supply voltage should be not less than 4 V, since the oscillator stops operating below 3.5 V. At a supply voltage of about 5 V, the base current of T_1 , and thus the output current, is rather smaller than stated. However, lowering the value of R_3 is not advisable, since the output of gate IC_{2a} is high-impedance.